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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/704,102 | 11/01/2000 | Stuart Courtney | ETK/226 | 3429 |

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Thomas W.Humphrey
WOOD, HERRON & EVANS, L.L.P.
2700 Carew Tower
441 Vine Street
Cincinnati, OH 45202

| EXAMINER |
|---|
| SAINT SURIN, JACQUES M |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2856 | 6 |

DATE MAILED: 04/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

| Offic Action Summary | Application No. 09/704,102 | Applicant(s) COURTNEY ET AL. | |
|---|---|---|---|
| | Examiner Jacques M Saint-Surin | Art Unit 2856 | |

-- Th MAILING DATE f this communication appears on the cover sheet with the correspondence address --

**Period f r Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *05 February 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disp sition of Claims**

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

## *DETAILED ACTION*

### *Response to Amendment*

1. This Office Action is responsive to the amendment of 02/05/02.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### *Claim Rejections - 35 USC § 102*

3. Claims 1, 10, 12-13, 22 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Piety et al (US Patent 6,078,874).

Regarding claims 1 and 13, Piety et al. ('874) discloses:

a data collector (machine data collection 10, see: Fig. 1), comprising:

a housing (hand-held sensor unit 30 includes a housing, see: Figs 1-2, col. 2, line 41;

a vibration signal input on said housing (sensory contact between the sensor unit 40 and machine 12 may be established by placing the sensor unit 40 in physical contact with a desired measurement point as shown in Fig. 1 in order to sense a machine 12 operating characteristic such as vibration, see: col. 4, lines 55-60);

an analog to digital converter (A/D converter 110, see: Fig. 3, col. 6, line 1) within said housing (hand-held sensor unit 40) connected to said vibration signal input, converting a vibration signal received at said vibration signal input to a digitized vibration signal,

an optical system (tachometer and LED 46, note that it is known that LED or lasers are used as sources of light) within said housing (40) and (col. 9, lines 38-42

disclose sensor unit 40 having both a vibration sensor and a tachometer, the HPC 32 may prompt the sensor unit to collect both types of machine operating characteristics), said optical system (a tachometer) is mounted on the machine 12 and communicates wirelessly with the sensor unit 40 via the wireless communications part 44, see: col. 9, lines 64-67) receiving light (LED 46) from outside said housing (40);

a receiver circuit (base instrument HPC 32 , see: Fig. 3, col. 6, lines 54-55) converting said received light (LED) to a digital signal, and a digital signal processing circuit (microprocessor 70 obtains a first set of data signals including vibration signals and tachometer signals, see: col. 9, line 67, and col. 10, lines 1-2) connected to said analog to digital converter (A/D converter 110) and said receiver circuit (HPC 32), and simultaneously receiving, storing or processing said digitized vibration signal and/or said digital signal converted from said received light (after the requested data has been collected, the tachometer signal and/or vibration signal (or data derived by the sensor unit 40 from the two signals) is downloaded to the HPC 32 and stored in the memory, see: col. 9, lines 43-47) using the tachometer signals, the microprocessor 70 synchronously averages the vibration signals and computes a frequency spectrum and demodulation which includes the process of acquiring modulated frequencies of interest which are rectified and low pass filtered to separate the modulated frequencies, see: Fig. 3 and col. 9, line 67, col. 10, lines 1-11), for the purpose of predictive maintenance .

Regarding claim 13, it is a method claim that performs the steps of the apparatus of claim 1. Therefore, it is rejected for the reasons set forth above.

Regarding claims 10 and 22, Piety ('874) discloses a storage device (base instrument 32 which is a microprocessor including memory (volatile and non-volatile), see: col. 5, lines 14-15.

Regarding claims 12 and 24, Piety ('874) discloses hand held sensor unit 40 includes a housing dimensioned and configured for being hand-held by the operator, see: col. 2, lines 41-42.

***Claim Rejections - 35 USC § 103***

4. Claims 2-9, 11-21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Piety et al. (US Patent 6,078,874) in view of Van Voorhis (US Patent 5,059,901).

Regarding claims 2-3, and 14-15, Piety et al. ('874) discloses sensor unit 40 having both a vibration sensor and a tachometer which meets the limitations of optical system. However, Piety et al. ('874) does not specifically suggest a light source emitting light through an aperture in said housing for reflection and return to said optical system. Van Voorhis ('901) discloses a laser light source and further discloses a laser light tachometer for measuring the rotational speed of a selected rotating body without making physical contact with that body, see abstract. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the tachometer of Piety et al. for that of Van Voorhis because it would have been obvious to provide a tachometer as a laser light source for the purpose of generating a light through an aperture of the data collector for measuring the rotational speed of a

selected rotating body without making physical contact with that body in an efficient manner, thereby making the above combination very effective and reliable.

Regarding claims 4-5 and 16-17, Piety et al. ('874) in view of Van Voorhis discloses a laser diode 11 and a collimating lens 15, (see: col. 4, lines 12-13 of Van Voorhis). As per claim 5, Piety in view of Voorhis discloses a light detector (photodiode 23) and a beam splitter 19, see: col. 4, lines 7 and 1.

Regarding claims 6-7 and 18-19, Piety in view of Van Voorhis discloses a PIN photodiode 23 for converting received light to an electrical signal, see: col. 4, lines 7-8. As per claim 7, Van Voorhis discloses signal conditioning circuit 35 of device 10 that comprises a threshold comparator, see: col. 3, lines 64-66.

Regarding claims 8 and 20, Piety ('874) in view of Van Voorhis ('901) discloses a laser light tachometer for measuring the rotational speed of a selected rotating body, (see: abstract of Van Voorhis).

Regarding claims 9 and 21, Piety ('874) in view of Van Voorhis ('901) discloses a dichroic filter 28, see: col. 4, line 14 of Van Voorhis).

Regarding claims 11 and 23, Piety ('874) in view of Van Voorhis ('901) discloses microcomputer 60 that includes display 122, input keys 126, see: Fig. 1 of Piety.

***REMARKS***

5. Applicant's argument states that "This application relates to a data collector having both a vibration sensor and integral optical system usable together in collecting data" and "As one example, noted at page 14, lines 14-19, the speed of rotation of a machine may be optically measured by a laser tachometer".

The Examiner agrees with Applicant's argument, however, US Patent 6,078,874 of Piety clearly discloses in col. 9, lines 38-47 sensor unit 40 having both a vibration sensor and a tachometer, the HPC 32 may prompt the sensor unit to collect both types of machine operating characteristics and after the requested data has been collected, the tachometer signal and/or vibration signal (or data derived by the sensor unit 40 from the two signals) is downloaded to the HPC and stored in memory.

6. Applicant's argument further states that Van Voorhis merely shows a laser light tachometer and it contains no suggestion of a single device having both a tachometer (or any other optical device) and a vibration sensor.

The Examiner, respectfully, disagrees with Applicant's argument because as discussed above and in the last office action, Piety clearly discloses sensor unit 40 having both a vibration sensor and a tachometer and Van Voorhis discloses a laser light tachometer which provides a beam of light to be used to measure the rotational speed of a rotating device. Furthermore, it is not necessary that the references actually suggest, expressly or in so many words, the changes or improvements that applicant has made. The test for combining references is what the references as a whole would have suggested to one of ordinary skill in the art. In re Sheckler, 168 USPQ 716 (CCPA 1971); In re McLaughlin 170 USPQ 209 (CCPA 1971); In re Young 159 USPQ 725 (CCPA 1968).

***Response to Arguments***

5. Applicant's arguments filed 2/5/02 have been fully considered but they are not persuasive.

***Conclusion***

6 **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacques M Saint-Surin whose telephone number is (703) 308-3698. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (703) 305-4705. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

Jacques M. Saint-Surin
April 10, 2002

HEZRON WILLIAMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800